

N<sup>o</sup> 12,949



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PROVISIONAL SPECIFICATION.

**Improvements in Electric Apparatus applicable for Exercising and Therapeutic purposes.**

I, FRED BURKS, of Buffalo, United States, of America, at present residing at Lancaster Road Fallowfield, Manchester, County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention which has been partly communicated to me by Charles Rohlf, of Buffalo, United States of America, Designer, to be as follows;—

This invention relates more particularly to an electrical apparatus comprising an electric current generating machine, contained in or supported by a dumb-bell or other portable device adapted for exercising purposes and operated to produce the current by the manipulation of the container, and electrical connections for transmitting the current generated by the machine to the person using the apparatus.

The object of the invention is to provide an apparatus of attractive and pleasing character, and of simple, durable and inexpensive construction, suitable both for exercising and therapeutical purposes.

It consists essentially of a dumb-bell or other portable appliance constructed with an electric generating machine from which an electric current is transmitted to the user.

A portable appliance capable of being grasped in the hand is constructed preferably in the form of a dumb-bell with hollow balls or heads connected by a tubular handle or shank.

In the bell an electric current generating machine is placed and a motor or mechanism for generating the same and also an electrode for conducting the current to the hand of the person using the apparatus. The bell is preferably made of metal to give an extended contact surface for the hand, but as will be manifest, the bell could be made of wood or other insulating material and provided with a metal handle or contact plate for the hand at any suitable point.

The electro-magnetic machine may consist of a permanent horse shoe magnet arranged and held between wooden insulating blocks, and an armature which is arranged, between the opposite poles of the magnet and supported on an armature shaft provided at one end with a journal entering a bearing hole in the bent end of the magnet, and at the other end with a journal entering a hole in a bearing plate which spans the ends of the magnet.

The armature is provided with the usual winding connected at one end to the armature and at the other end to an insulated collector ring.

The armature of the magneto-electric machine is rotated to generate the current by a motor consisting of a weight confined loosely in and adapted to reciprocate longitudinally in the shank of the dumb bell. The weight is reciprocated from end to end of the shank by alternately inverting and righting the dumb-bell and this movement of the weight is transmitted to the armature shaft to rotate the armature by suitable connections, such as a belt or

[Price 8d.]



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cord attached at its two ends to the opposite ends of the movable weight and passing into the head containing the generating machine around a pulley on the armature shaft and around a tensioning pulley or sheave mounted in the other head of the dumb-bell. The intermediate portion of the belt passes freely through a longitudinal hole groove or slot in the weight. The belt is moved to and fro by the reciprocating movements of the weight and turns the armature shaft and armature alternately in opposite directions, thus producing a current. The tensioning pulley or sheave is preferably journaled in an adjustable yoke or frame which is connected by an adjustable screw with a stationary frame secured in the head of the dumb-bell. The stationary frame is preferably of U-shape and is fixed by screws in the end of the shank which extends into the head. The upper ends of the legs of the U frame are bent downwardly besides the sheave yoke to hold the latter from turning. The head of the dumb-bell is provided opposite the end of the adjusting screw with a hole through which a screw driver can be inserted and engaged with the adjusting screw for turning the same. This construction affords a convenient means for adjusting the tensioning pulley or sheave to properly tighten or slacken the driving belt or cord. Yielding buffers or springs are secured in the opposite ends of the shank of the dumb-bell to receive the impact of the weight and lessen the effect of the concussion and shock on the hand.

While a belt or cord is described for transmitting the motion of the weight to the armature shaft, other transmitting connections could be employed, the belt or cord, however, is an inexpensive and desirable connection.

The dumb-bell containing the generating machine, which will hereinafter be termed the "container", constitutes an electrode and is connected to one terminal of the machine in any convenient manner, for instance, by a contact plate of brush secured to one of the supporting blocks for the magnet with one end bearing against the collector ring on the armature shaft and the other end contacting with the metallic head of the container.

A second electrode connected to an insulated conducting wire enters the head of the container and is connected in any suitable manner to the other terminal of the generating machine. The electrode, which will hereinafter be called the "electrode" to distinguish it from the container, is preferably of the same shape, size and weight as the container to create the impression of being a duplicate container provided with a generating machine, and for this purpose a sliding weight, similar to the weight for operating the generating machine, is loosely confined to reciprocate in the shank of the electrode which is provided with yielding buffers or springs at the opposite ends of the shank to relieve the jars incident to the operation of the weight. The electrode may be in the form of a hollow metal shell like the container, or may be made of insulating material provided with a metal contact plate or portion. When the electrode is held in one hand and the container in the other hand and both devices manipulated the reciprocating weights in the two devices produce like impacts or jars on the container and electrode, thus creating the impression that each contains a generating machine.

In using the apparatus the user holds the container and electrode in his two hands and manipulates the same, in such manner as to reciprocate the weights, thus driving the generating machine as before explained, and a current is generated which traverses the circuit completed through the container and electrode, the conductor connecting the same and the arms and body of the person using the apparatus.

Instead of the hand electrode the conducting wire could be connected with an electrode of any sort adapted to be placed in contact with any desired portion of the person's body.

The magneto-electric machine is preferably provided with a rheotome or circuit interrupter. The interrupter employed is of known construction, consisting of a star wheel which is secured to the armature shaft of the generator and in the rotation of the shaft intermittently contacts with a spring plate



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which is connected to or formed integrally with the contact plate connecting with the collector ring of the generator. The rheotome operates in a well known manner to interrupt and intermittently short circuit the current through the machine for raising the electro-motive force of the current in the external  
 5 circuit and intensifying its effect on the person, thereby enabling the use of a small machine generating a relatively feeble current, and also better adapting the apparatus for therapeutical purposes.

A dynamo electric machine could be substituted for the magneto-electric machine shown, but the latter is preferred because a small machine with a  
 10 permanent magnet of good quality will produce a stronger current than a dynamo electric machine of substantially the same dimensions, and is also cheaper than a dynamo electric machine.

Dated this 6th day of June, 1904.

15 J. OWDEN O'BRIEN,  
 Successor to and late of W. P. Thompson & Co. of Manchester.  
 Patent Agents.

## COMPLETE SPECIFICATION.

**Improvements in Electric Apparatus applicable for Exercising and Therapeutic purposes.**

20 I, FRED BURKS, of Buffalo, United States of America at present residing at Lancaster Road Fallowfield Manchester, County of Lancaster Mechanical Engineer do hereby declare the nature of this invention which has been partly communicated to me by Charles Rohlf's of Buffalo, United States of America Designer, and in what manner the same is to be performed, to be  
 25 particularly described and ascertained in and by the following statement;—

This invention relates more particularly to an electrical apparatus comprising an electric current generating machine contained in or supported by a dumb-bell or other portable device adapted for exercising purposes and operated to produce the current by the manipulation of the container, and electrical  
 30 connections for transmitting the current generated by the machine to the person using the apparatus.

The object of the invention is to provide an apparatus of attractive and pleasing character, and of simple, durable and inexpensive construction, suitable both for exercising and therapeutical purposes.

35 It consists essentially of a dumb-bell or other portable appliance constructed with an electric generating machine from which an electric current is transmitted to the user.

In the accompanying drawings

Fig. 1 is a sectional elevation of an apparatus embodying the invention.  
 40 Fig 2 is a sectional elevation of the bell containing the generating machine in line 2—2 Fig. 1.

Fig. 3 is a horizontal section partly in plan on an enlarged scale in line 3—3 Fig. 2. Fig. 4 is a fragmentary sectional elevation in line 4—4, Fig. 3.

Like letters of reference refer to like parts in the several figures.

45 (A) represents a portable device preferably in the form of a hollow dumb-bell having enlarged balls or heads (*a*), (*a*<sup>1</sup>) connected by a central tubular handle or shank. The bell constitutes a container for the electric-current-generating machine and a motor for driving the same, and also an electrode



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for conveying the current to the hand of the person using the apparatus, and for this reason the bell is preferably made of metal to give an extended contact-surface for the hand; but, as will be manifest, the bell could be made of wood or other insulating material and provided with a metal handle or contact-plate for the hand at any suitable point. 5

An electric-current-generating machine is mounted in the head (*a*) of the dumb-bell, which is provided in the construction shown in the drawings with blocks (*b*) of wood or other insulating material for supporting the generating-machine and insulating the same from the metal portions of the dumb-bell. A magneto-electric machine is shown, consisting of a permanent horse-shoe-magnet (*C*) arranged and held between the wooden insulating blocks (*b*) and an armature (*D*), which is arranged, as usual, between the opposite poles of the magnet and supported on an armature-shaft (*d*), which is provided at one end with a journal entering a bearing-hole in the bent end of the magnet and at the other end with a journal entering a hole in a bearing-plate (*d*<sup>1</sup>), which spans the ends of the magnet, to which it is secured by screws or in any other suitable manner. The armature is provided with the usual winding connected at one end to the armature and at the other end to the usual insulated collector-ring (*e*). 10 15

The armature of the magneto-electric machine is rotated to generate the current by a motor, which in the construction illustrated consists of a weight (*F*), confined loosely in and adapted to reciprocate longitudinally in the shank of the dumb-bell. The weight is reciprocated from end to end of the shank by alternately inverting and righting the dumb-bell, and this movement of the weight is transmitted to the armature-shaft to rotate the armature by suitable connections, such as a belt or cord (*G*) attached at its two ends to the opposite ends of the movable weight and passing into the head (*a*) containing the generating-machine, around a pulley (*h*) on the armature-shaft, and around a tensioning pulley or sheave (*H*) mounted in the other head (*a*<sup>1</sup>) of the dumb-bell. The intermediate portion of the belt passes freely through a longitudinal hole (*h*<sup>1</sup>) in the weight. The belt is moved back and forth by the reciprocating movements of the weight and turns the armature-shaft and armature alternately in opposite directions, thus producing a current. 20 25 30

The tensioning pulley or sheave is preferably journaled in an adjustable yoke or frame (*i*) which is connected by an adjusting-screw (*i*<sup>1</sup>) with a stationary frame (*k*), secured in the head (*a*<sup>1</sup>) of the dumb-bell. The stationary frame is preferably of **U** shape and is fixed by screws (*i*<sup>2</sup>) in the end of the shank which extends into the head (*a*<sup>1</sup>). The upper ends of the legs of the **U**-frame are bent downwardly beside the sheave-yoke to hold the latter from turning. The head of the dumb-bell is provided opposite the end of the adjusting-screw with a hole (*k*<sup>2</sup>) through which a screw-driver can be inserted and engaged with the adjusting-screw for turning the same. This construction affords a convenient means for adjusting the tensioning pulley or sheave to properly tighten or slacken the driving belt or cord. 35 40

(*l*) (*l*<sup>1</sup>) represent yielding buffers or springs which are secured in the opposite ends of the shank of the dumb-bell to receive the impact of the weight and lessen the effect of the concussion and shock on the hand. 45

While a belt or cord is described for transmitting the motion of the weight to the armature-shaft, other transmitting connections could be employed. The belt or cord however, is an inexpensive and desirable connection. 50

The dumb-bell containing the generating-machine which will hereinafter be termed the 'container' constitutes an electrode and is connected to one terminal of the machine in any convenient manner for instance, by a contact plate or brush (*M*), secured to one of the supporting-blocks (*b*) for the magnet, with one end bearing against the collector-ring on the armature-shaft and the other end contacting with the metallic head of the container. 55

(*P*) represents a second electrode, connected to an insulated conducting-



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wire (*p*), which enters the head (*a*) of the container and is connected in any suitable manner to the other terminal of the generating-machine. The electrode (*P*), which will hereinafter be called the 'electrode' to distinguish it from the container, is preferably of the same shape, size and weight as the container to  
 5 create the impression of being a duplicate container provided with a generating-machine; and for this purpose a sliding weight (*Q*), similar to the weight for operating the generating-machine, is loosely confined to reciprocate in the shank of the electrode, which is provided with yielding buffers or springs at the opposite ends of the shank to relieve the jars incident to the operation of the weight.  
 10 The electrode may be in the form of a hollow metal shell like the container or may be made of insulating material provided with a metal contact plate or portion.

When the electrode is held in one hand and the container in the other hand and both devices manipulated, the reciprocating weights in the two devices  
 15 produce like impacts or jars on the container and electrode, thus creating the impression that each contains a generating-machine.

In using the apparatus the user holds the container and electrode in his two hands and manipulates the same in such manner as to reciprocate the weights, thus driving the generating-machine as before explained, and a current is  
 20 generated which traverses the circuit completed through the container and electrode, the conductor connecting the same and the arms and body of the person using the apparatus.

Instead of the hand-electrode (*P*) the conducting-wire could be connected with an electrode of any sort adapted to be placed in contact with any desired  
 25 portion of the person's body.

The magneto-electric machine is preferably provided with a rheotome or circuit-interrupter. The interrupter shown is of known construction, consisting of a star-wheel (*r*) which is secured to the armature-shaft of the generator and in the rotation of the shaft intermittently contacts with a spring-plate (*r*<sup>1</sup>)  
 30 which is connected to or formed integrally with the contact-plate (*M*) connecting with the collector-ring of the generator. The rheotome operates in a well-known manner to interrupt and intermittently short-circuit the current through the machine for raising the electro-motive force of the current in the external circuit and intensifying its effect on the person, thereby enabling the use of a  
 35 small machine generating a relatively feeble current and also better adapting the apparatus for therapeutical purposes.

A dynamo-electric machine could be substituted for the magneto-electric machine shown, but the latter is preferred, because a small machine with a permanent magnet of good quality will produce a stronger current than a  
 40 dynamo-electric machine of substantially the same dimensions and is also cheaper than a dynamo-electric machine.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed I declare that what I claim is:—

45 1. In an apparatus of the character described, the combination of a container, an electric-current-generating machine in said container, and means in said container and operated by the manipulation of the latter to drive said generating-machine, substantially as set forth.

2. In an apparatus of the character described, the combination of a container,  
 50 an electric-current generating machine in said container, a motor in said container and operated by the manipulation of the container, and connections between the motor and generating-machine for operating the latter, substantially as set forth.

3. The combination of a device to be held in the hand and manipulated, an  
 55 electric-current-generating machine supported by said device, means supported by said device and operated by the manipulation of the latter for driving said



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generating-machine, and electric connections for transmitting the electric current to a person, substantially as set forth.

4. The combination of a device constituting an electrode to be held in the hand and manipulated, an electric generating machine supported by said device, a motor supported by said device and operated by the manipulation of the same, connections between said motor and said generating-machine for operating the latter, an electrode and electrical connections for the current between said device and electrode, substantially as set forth. 5

5. The combination of a hollow container having a head and a shank, an electric-current-generating machine arranged in the head of said container, a reciprocating weight arranged to slide in the shank of said container and which is reciprocated by the manipulation of the container and connections between said weight and the armature of said generating-machine for operating the latter, substantially as set forth. 10

6. The combination of a container having a hollow head and a tubular shank, an electric-current-generating machine mounted in said head, a weight arranged to slide in said tubular shank and adapted to be reciprocated by the manipulation of said container, a pulley on the armature-shaft of said generating-machine, a tensioning pulley movably mounted in said container, a belt attached to said weight and passing around said pulleys for driving the armature, and means for adjusting said tensioning pulley, substantially as set forth. 15 20

7. The combination with a container, an electric-current generating machine, and a reciprocating motor for operating the same enclosed in said container, of an electrode in electrical connection with said generating-machine, said electrode containing a reciprocating weight, substantially as set forth. 25

8. In an apparatus of the kind described, the combination and arrangement of parts, substantially as herein described and illustrated on the accompanying drawing.

Dated this 7th day of March 1905.

For the Applicant, 30  
JOHN G. WILSON & Co.  
Manchester.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1905.





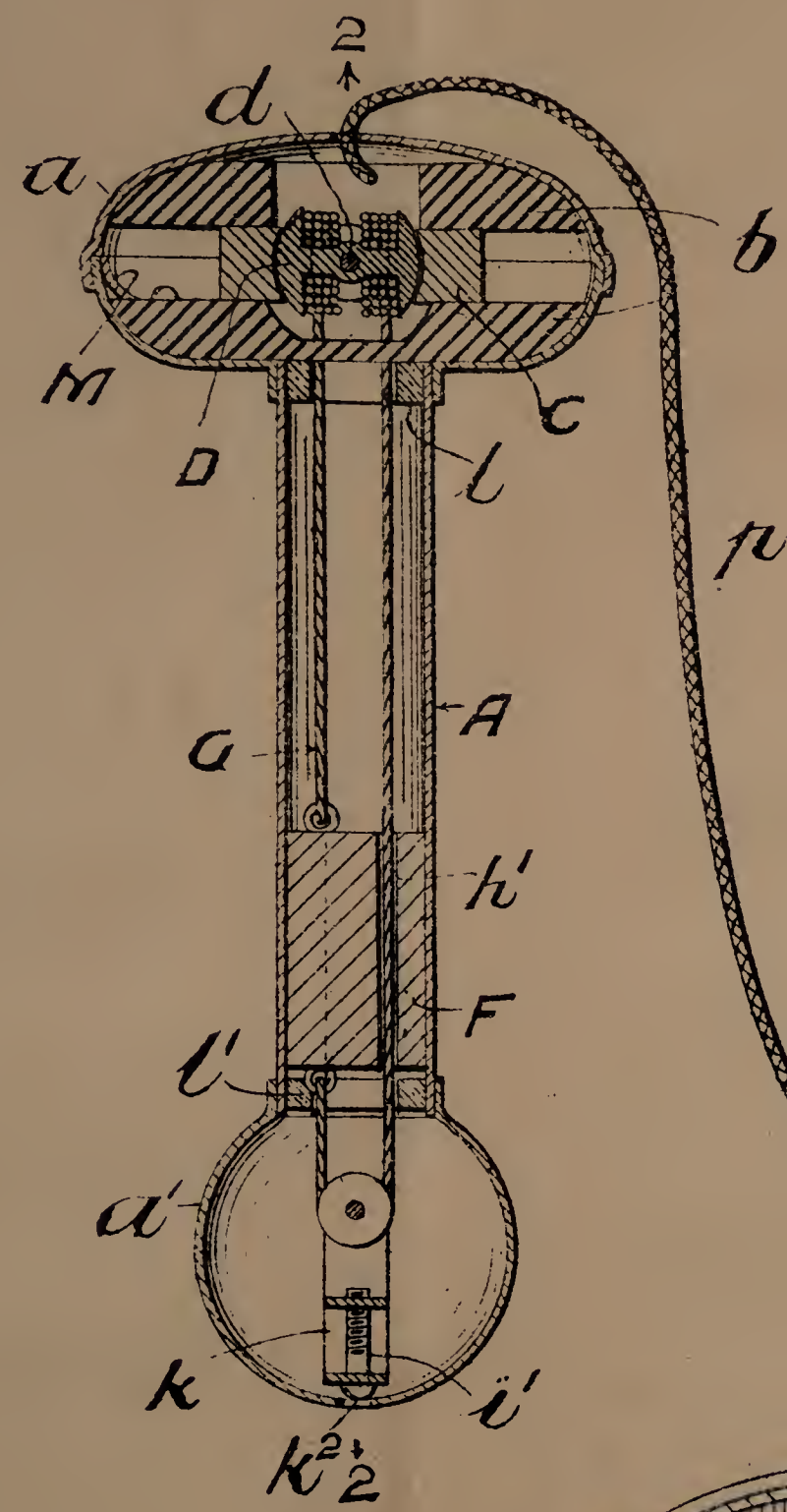


FIG. 1.

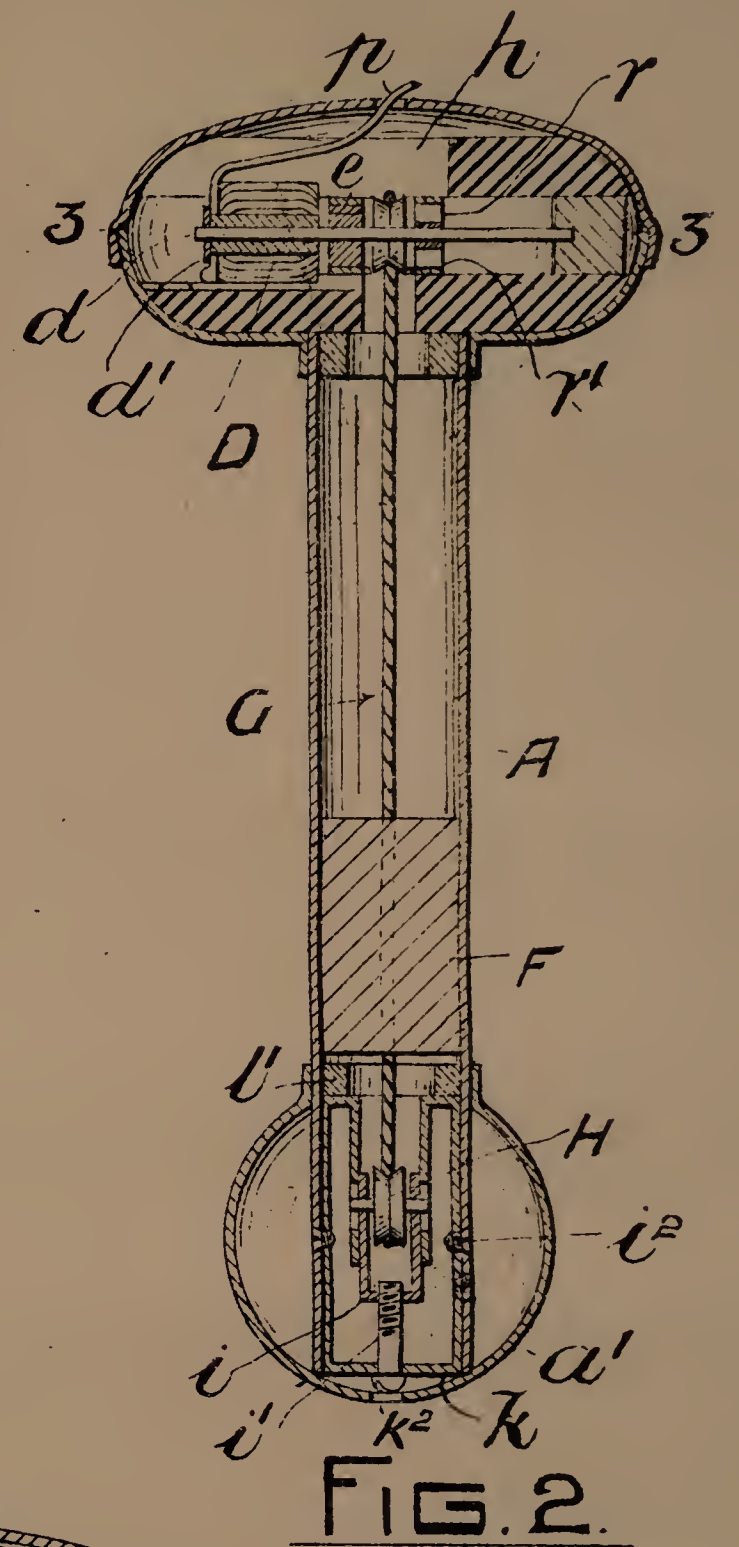
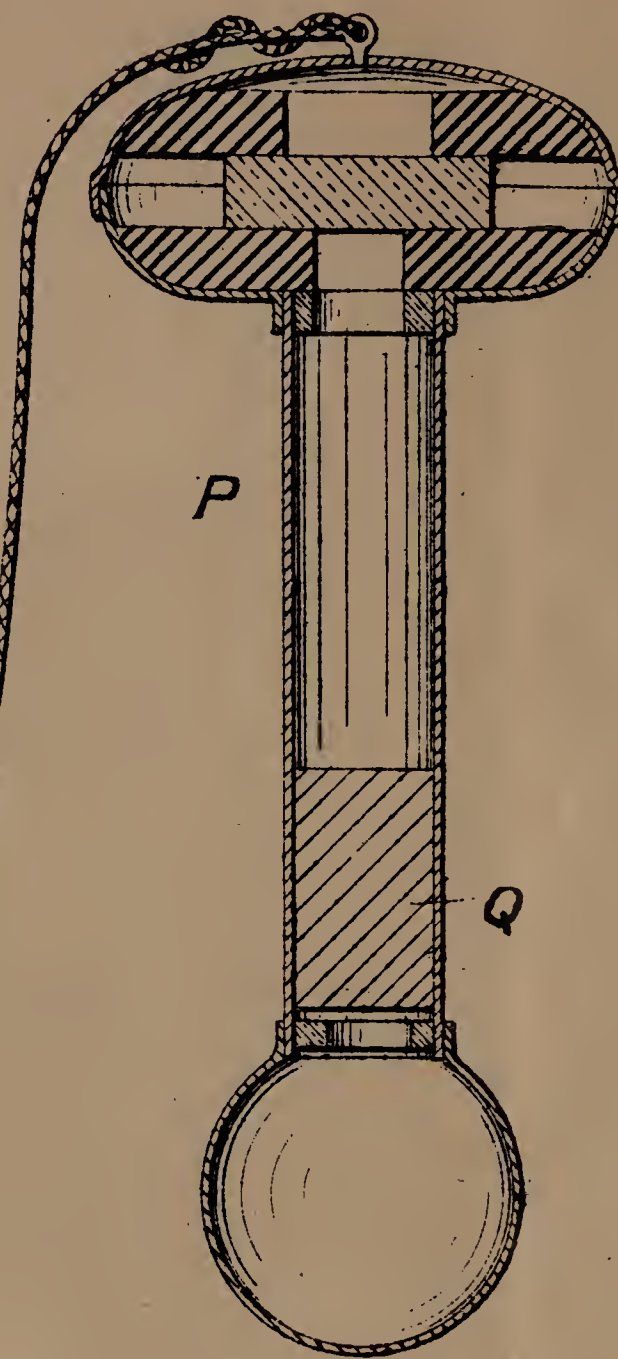


FIG. 2.

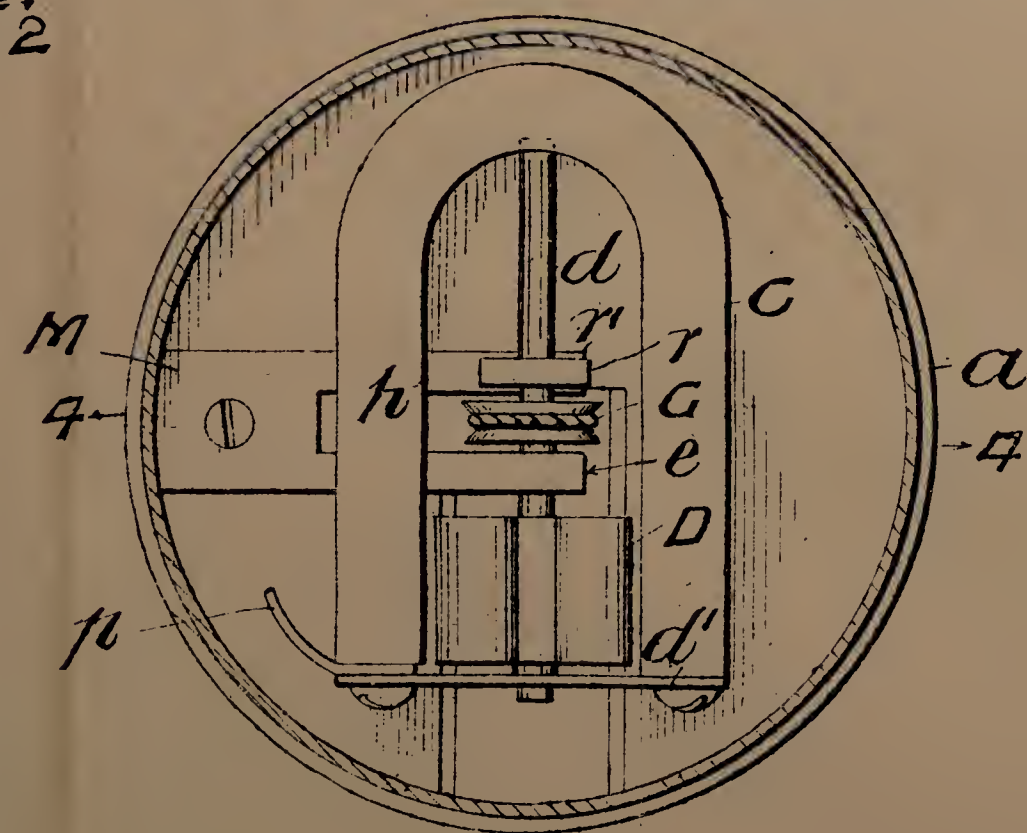


FIG. 3.

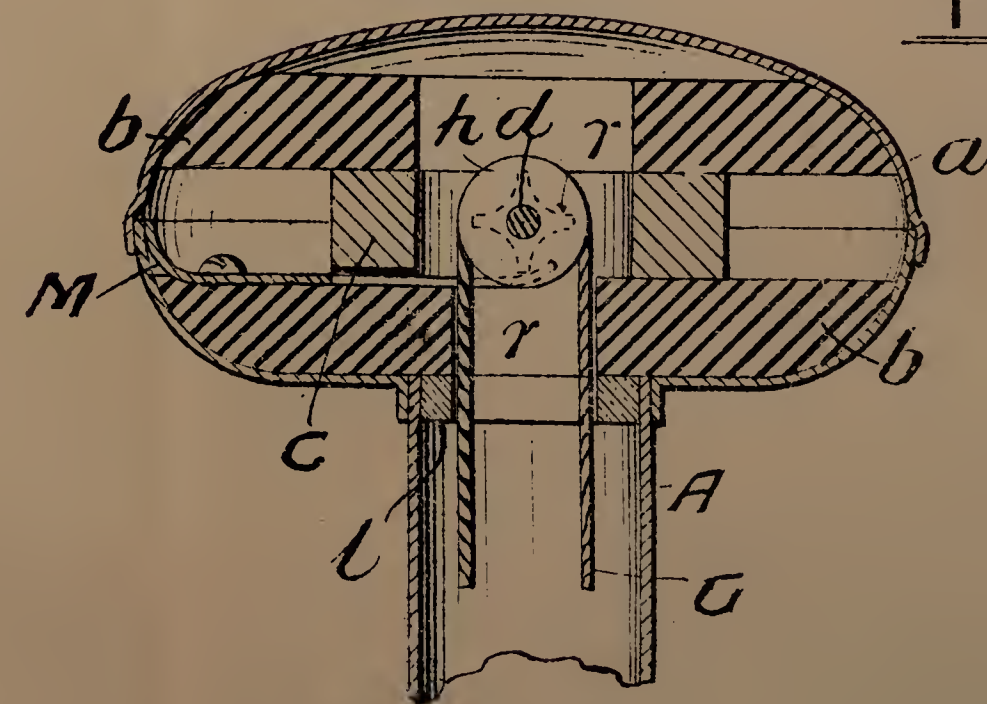


FIG. 4.

[This Drawing is a reproduction of the Original on a reduced scale.]

